

Amendments to the Specification

Please replace paragraph [0007] with the following amended paragraph:

[0007] State of charge (SOC) is defined generally as the ratio of the residual charge in a battery or battery pack relative to full charge capacity. Significant attention has been given to maintaining the operational performance of batteries used as the ESS in HEV applications. Particular attention has been given to various aspects of not only maintaining the battery pack state of charge but also preventing battery pack overcharge and depletion which can lead to battery pack damage. Various hardware and software control strategies have been suggested for determining and maintaining the SOC of battery packs and preventing potentially damaging operation at ~~extrem~~ extreme low and high SOC conditions. Unfortunately, however, known systems effective to prevent damage to battery packs do so by shutting down further energy transfers into and out of the battery pack, thereby undesirably disabling vehicle operation or severely limiting vehicle performance until service can be sought.

Please replace paragraph [0011] with the following amended paragraph:

[0011] In accordance with a preferred implementation, a plurality of state of charge thresholds are provided at extreme regions of ~~stet~~ state of charge. Increment values are provided ~~corresponding~~ corresponding to these thresholds. The increment values are generally larger at more extreme states of charge. As long as the state of charge violates any of the thresholds, a counter increments in accordance with the increment corresponding to the violated threshold. A predetermined counter limit is provided which, if exceed, will result in an indication that a critical state of charge condition is present.

Please replace paragraph [0036] with the following amended paragraph:

GMC3135

2 of 12

[0036] As should be apparent from the foregoing description the EVT 10 selectively receives power from the engine 14. As will now be explained with continued reference to FIG. 2 the EVT also receives power from an electric energy storage device or system (ESS), such as one or more batteries in battery pack module (BPM) 21. As used herein, reference to a battery includes not only a single battery, also includes any combination of single or multiple batteries, or cells thereof, into a battery pack or array, or a plurality of battery packs or arrays. BPM 21 is preferably a parallel array of battery packs, each of which comprises a plurality of batteries. As used herein, the term battery generally refers to any secondary or rechargeable battery, but those comprising lead/acid, nickel/metal hydride (Ni/MH), or Li/ion or polymer cells are preferred. Other electric energy storage devices that have the ability to store electric power through charging and dispense electric power through discharging, such as super capacitors or ultracapacitors, may be used in place of, or in combination with, the batteries without altering the concepts of the present invention. The BPM 21 is high voltage DC (e.g., about 650 V in an exemplary embodiment) coupled to dual power inverter module (DPIM) 19 via DC lines 27. Current is transferable to or from the BPM 21 in accordance with whether the BPM 21 is being charged or discharged. BPM 21 also comprises a conventional microprocessor based controller comprising such common elements as microprocessor, read only memory ROM, random access memory RAM, electrically programmable read only memory EPROM, high speed clock, analog to digital (A/D) and digital to analog (D/A) circuitry, and input/output circuitry and devices (I/O), temperature sensors and appropriate signal conditioning and buffer circuitry necessary to monitor the state of the battery and transmit this information to other portions of the control system, e.g. system controller 43, for use in the overall control of the vehicle. This includes sensing, processing, calculating and otherwise monitoring various parametric information regarding the state or condition of the battery, such as temperature, current and voltage while charging and discharging, and state of charge (SOC), which comprises the instantaneous amount of energy

GMC3135

3 of 12

stored in the battery expressed as a percentage of its total energy storage capacity.

The information concerning these parameters is provided to other portions of the vehicle control system for use in conjunction with control algorithms which make use of battery parametric information, such as those used to establish SOC related charge and discharge limits, amp-hour/hour or energy throughput limits, temperature limits or other battery-related control functions. Further details regarding ESS monitoring and functionality the can be found in commonly assigned, co-pending US patent application Serial No.10/686,180 (~~Attorney Docket No. GP-304119~~) and US patent application Serial No.10/686,174 (~~Attorney Docket No. GP-304120~~), which are incorporated herein by reference.

GMC3135

4 of 12